UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

4 August 2009

CRUISE RESULTS

NOAA FSV *Henry B. Bigelow*
Cruise No. HB 09-01 (Parts I - V)
Spring Bottom Trawl Survey

CRUISE PERIOD AND AREA

The HB 09-01 bottom trawl survey was conducted in 5 parts: Part I was from 27 – 28 February and 2 – 13 March; Part II, 17 – 27 March; Part III, 31 March – 10 April; Part IV, 14 – 24 April; and Part V, 28 April – 9 May. The area of operation was the continental shelf from Cape Lookout, NC, to the Nova Scotia Shelf, including Georges Bank and the Gulf of Maine. Station locations are shown in Figures 1 and 2.

OBJECTIVES

The objectives of the cruise were to: (1) determine the seasonal distribution, relative abundance, and biodiversity of fish and invertebrate species found on the continental shelf; (2) collect biological samples for age determinations and growth studies, fecundity, maturity and feeding ecology; (3) collect hydrographic and meteorological data; (4) collect samples of ichthyoplankton and zooplankton for relative abundance and distribution studies; (5) collect data and samples for cooperative researchers and programs; and (6) conduct a hydroacoustic survey between stations.

METHODS

Operations and gear used during HB 09-01 Parts I-V conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 6 February 2009 and Addendum 1 dated 20 February; Addendum 2 dated 6 March; Addendum 3 dated 17 March; Addendum 4 dated 2 April; and Addendum 5 dated 22 April. Exceptions to the Cruise Instructions were: Part I came into port for three days due to bad weather; Part IV arrived in Boston one day early; and Part V returned two days early due to the completion of the survey.

A 20-minute survey trawl haul was made at each pre-selected station. Additional stations during the operation of the cruise were added for gear testing. The standard towing speed was 3.0 knots, speed over ground. The scope ratio used varied with depth and was determined by the new NEFSC Bottom Trawl Survey Protocol for FSV *Bigelow*. Sampling was conducted using a NEFSC standardized 4 seam, 3 bridle survey trawl rigged with a rockhopper sweep. The trawl was fished using 2.2 m^2, 550kg, Poly Ice Oval trawl doors and 36.6 meter (20 fathom) bridles. In addition, net monitoring equipment was used to monitor trawl performance on all stations.

Throughout the cruise, a hydroacoustic survey was conducted during transit between bottom trawl stations using the Simrad EK-60 system.

After each tow, the catch was sorted by species and weighed using motion compensated digital scales. Representative length frequencies were collected for all species caught. All catch and biological data were recorded using the shipboard automated data entry system, Fisheries Scientific Computing System (FSCS). This system uses digital scales, electronic measuring boards, touch screen displays and barcode scanners to record data on deck and archives the data on the ship's computer network.

Sampled fish were assigned individual identification numbers, measured, weighed to the nearest 0.001 kilogram (kg) and further sampled for age and growth studies. Bony fish were measured to the nearest centimeter (cm) to the end of the central caudal ray (fork length); biological samples were collected concurrently with measuring operations (Table 1). Sharks and skates were measured to the end of the caudal fin (total length). Disk width was measured for rays. Lobsters were measured in millimeters (mm) from the posterior edge of the eye socket to the end of the carapace; the presence or absence of a V-notch was also noted. Crabs were measured across the carapace width (cm). Shell height was measured in (cm) for selected bivalves. The remainder of the catch (miscellaneous invertebrates, shells, substrate, et cetera) was also recorded.

Surface temperatures were measured using the hull-mounted temperature sensor at a depth of 3 meters. Temperature and conductivity profiles were made at each survey trawl station using a conductivity, temperature, and depth (CTD) system. Bottom salinity samples were obtained to calibrate the CTD. Water samples were also taken for fluorometer calibrations.

Samples of fish eggs and larvae were collected at selected stations. Plankton sampling gear consisted of a 61 cm bongo frame fitted with 0.333 mm mesh nets. Digital flowmeters were suspended within the mouths of the bongo frame to estimate water volume filtered. The net was towed at 2.8-3.8 kilometers/hour (1.5-2.0 knots). A CTD was deployed at each plankton station.

RESULTS

The survey sampled at 437 stations with 100, 91, 80, 70, and 96 stations completed on HB 09-01 Parts I-V, respectively.

Standard plankton tows were made at 116 stations. Bottom temperatures were collected at 403 stations using the CTD system. Bottom water samples for CTD calibration were taken at 81 stations.

A total of 14,303 feeding ecology and 16,288 age and growth samples were collected from 32 species (Table 1). A total of 8,835 samples were collected to support 26 internal and external investigations (Table 2).

DISPOSITION OF SAMPLES AND DATA

Age and growth samples, maturity data, trawl catch data and hydrographic data will be analyzed at the NEFSC Woods Hole, Massachusetts Laboratory. The various collections were forwarded to the individuals listed in Table 2. Resulting data will be audited, edited, and loaded into the NEFSC trawl survey database.

SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Woods Hole, MA

John Galbraith, Chief Scientist[1, 2]
Sean Lucey[3], Chief Scientist[4]
Philip Politis, Chief Scientist[3]
Stacy Rowe[2], Chief Sceintist[5]
Robert Alexander[2, 5]
Takashi Arbusto[1, 4]
Larry Brady[1, 3]
Elizabeth Brooks[1]
Elisabeth Broughton[5(28 April - 5 May)]
David Chevrier[1, 4]
Sarah Emery[3]
Michael Jech[3]
Paul Kostovick[4]
Shad Mahlum[1, 2, 3]
Richard McBride[3]
Sarah Merry[1]
Victor Nordahl[1]
Richard Raynes[5]
Nicole Rossi[5]
Grace Thornton[2, 5]
Mark Wuenschel[4]

National Marine Fisheries Service, NERO, Gloucester, MA

Jennifer Alsen[5]
Caleb Gilbert[5]

National Marine Fisheries Service, NEFSC, Sandy Hook, NJ

John Rosendale[4, 5]

New England Fisheries Management Council, Newburyport, MA

Andrew Applegate[4]

University of Massachusetts, Amherst, MA

Joseph Kunkle[3]

University of Massachusetts, Dartmouth, MA

Jonathan Breton[3, 4]

University of Rhode Island, Narragansett, RI

Carrie Byron[4]

Contractors

Laurel Col[2]	ITS, Woods Hole, MA
Heath Cook[1, 2, 4, 5]	ITS, Woods Hole, MA
Joshua Cutler[1, 2, 4, 5]	ITS, Woods Hole, MA
Jakub Kircun[1, 2, 4, 5]	ITS, Woods Hole, MA
Amy Liljestrand[1]	ITS, Woods Hole, MA
Janet Nye[1]	ITS, Woods Hole, MA
Geoff Shook[3, 4]	ITS, Woods Hole, MA
Francine Stroman[2, 3, 5]	ITS, Woods Hole, MA
Melanie Underwood[1, 2, 3, 5]	ITS, Woods Hole, MA

Volunteers

Sharon Benjamin[4]	New York, NY
Colin Brauns[5]	Cambridge, MA
Savanna Brom[2]	University of Wisconsin, WI
Kari Fenske[3]	Lusby, MD
James Gartland[3]	Williamsburg, VA
Marina Knize[2]	Coral Gables, FL
Kimberly Regan[3]	Temple Terrace, FL
Amanda Scuesa[2]	Amherst, MA
Keiichi Uchida[2, 4]	Tokyo, Japan
Austin Ward[1]	Machipongo, VA

[1] 27-28 February and 2-13 March
[2] 17 – 27 March
[3] 31 March – 10 April
[4] 14 – 24 April
[5] 28 April – 9 May

For further information contact Russell Brown, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Phone (508) 495-2380; FAX (508) 495-2115; Russell. Brown @noaa.gov. The Resource Survey Report for this survey and the cruise results can be viewed at: http://www.nefsc.noaa.gov/esb/.

Table 1. Field observations and samples collected for age and growth studies on NOAA FSV *Henry B. Bigelow*, Spring Bottom Trawl Survey, during 27 February to 9 May 2009.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian Redfish	276	919
American Plaice	444	1,136
American Shad	104	---
Atlantic Cod	401	977
Atlantic Croaker	5	4
Atlantic Halibut	29	29
Atlantic Herring	480	1,818
Atlantic Mackerel	228	430
Atlantic Menhaden	6	---
Atlantic Wolffish	35	25
Barndoor Skate	334	---
Black Sea Bass	70	188
Blackbelly Rosefish	134	---
Blueback Herring	175	---
Bluefish	6	10
Buckler Dory	9	---
Butterfish	132	392
Clearnose Skate	220	---
Cunner	17	---
Cusk	25	27
Fawn Cusk-Eel	59	---
Fourbeard Rockling	115	---
Fourspot Flounder	263	390
Goosefish	269	525
Gulf Stream Flounder	139	---
Haddock	497	648
Little Skate	1,385	---
Longhorn Sculpin	641	---
Northern Kingfish	3	---
Northern Searobin	126	---
Ocean Pout	490	310
Offshore Hake	100	112
Pollock	64	166
Red Hake	717	585
Rosette Skate	66	---
Scup	26	65
Sea Raven	360	---
Silver Hake	1,042	1,106
Smooth Dogfish	124	---
Smooth Skate	238	---
Spiny Dogfish	602	539
Spot	2	---
Spotted Hake	293	276
Striped Bass	135	124
Striped Searobin	22	---
Summer Flounder	267	757

Species	Feeding Ecology Observations	Age and Growth Samples
Thorny Skate	166	---
Tilefish	3	2
Weakfish	1	1
White Hake	326	977
Windowpane	450	515
Winter Flounder	565	1,186
Winter Skate	603	---
Witch Flounder	612	716
Yellowtail Flounder	402	1,333
TOTALS	14,303	16,288

Table 2. Miscellaneous scientific collections made on NOAA FSV *Henry B. Bigelow*, Spring Bottom Trawl Survey, during 27 February to 9 May 2009.

Investigator and Affiliation	Samples Saved	Approximate Number
Daniel Badger, New England Aquarium, Boston, MA	various species	152 indiv.
Walter Bubley, U. of New Hampshire, Durham, NH	spiny dogfish	11 indiv.
Michael Burton, NMFS, Beaufort, NC	black sea bass	48 indiv.
Peter Chase, NMFS, NEFSC, Woods Hole, MA	scup	656 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	unidentified/various species	2,258 indiv.
Todd Gedamke, NMFS, SEFSC, Miami, FL	various skates	316 preserved
Guest	various species	60 indiv.
Dvora Hart, NMFS, NEFSC, Woods Hole, MA	marginated sea stars	155 indiv.
Francis Juanes, U. of Massachusetts, Amherst, MA	offshore hake	64 preserved
Chad Keith, NMFS, NEFSC, Woods Hole, MA	atlantic wolffish	19 examined
	atlantic wolffish	20 indiv.
	spiny dogfish	1 indiv.
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	various sharks	13 tagged
Joseph Kunkel, U. of Massachusetts, Amherst, MA	american lobster	2 preserved
Jason Link/Brian Smith, NMFS, NEFSC, Woods Hole, MA	various species	284 preserved
Rich McBride, NMFS, NEFSC, Woods Hole, MA	various flounders	273 examined
	gonads, various species	261 preserved
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	various species	136 examined
Joseph Mello, NMFS, NEFSC, Woods Hole, MA	atlantic angel shark	9 indiv.
	atlantic angel shark	10 tagged
Rachel Metz-Leland, NMFS, NEFSC, Woods Hole, MA	various species	43 indiv.
Tom Munroe, NMFS, NSL, Washington, DC	various species	794 indiv.
Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA	atlantic cod	450 examined
Michael Palmer, NMFS, NEFSC, Woods Hole, MA	atlantic cod	99 examined
	haddock	61 examined
Kathy Sosebee, NMFS, NEFSC, Woods Hole, MA	various skates	1,633 examined
	various rays	32 examined
	spiny dogfish	273 examined
Michelle Staudinger, U. of Massachusetts, Amherst, MA	various cephalopods	271 indiv.
Keiichi Uchida, Tokyo U. of Marine Science and Technology, Tokyo, Japan	conger eel	16 indiv.
	conger eel	2 examined
	spiny dogfish	1 indiv.
Byron White, NMFS, NLS, Washington, DC	blackbelly rosefish	20 preserved
Workshop, NMFS, NEFSC, Woods Hole, MA	various species	188 indiv.
Mark Wuenschel, NMFS, NEFSC, Woods Hole, MA	various gadids	94 examined
	gonads, various gadids	110 preserved

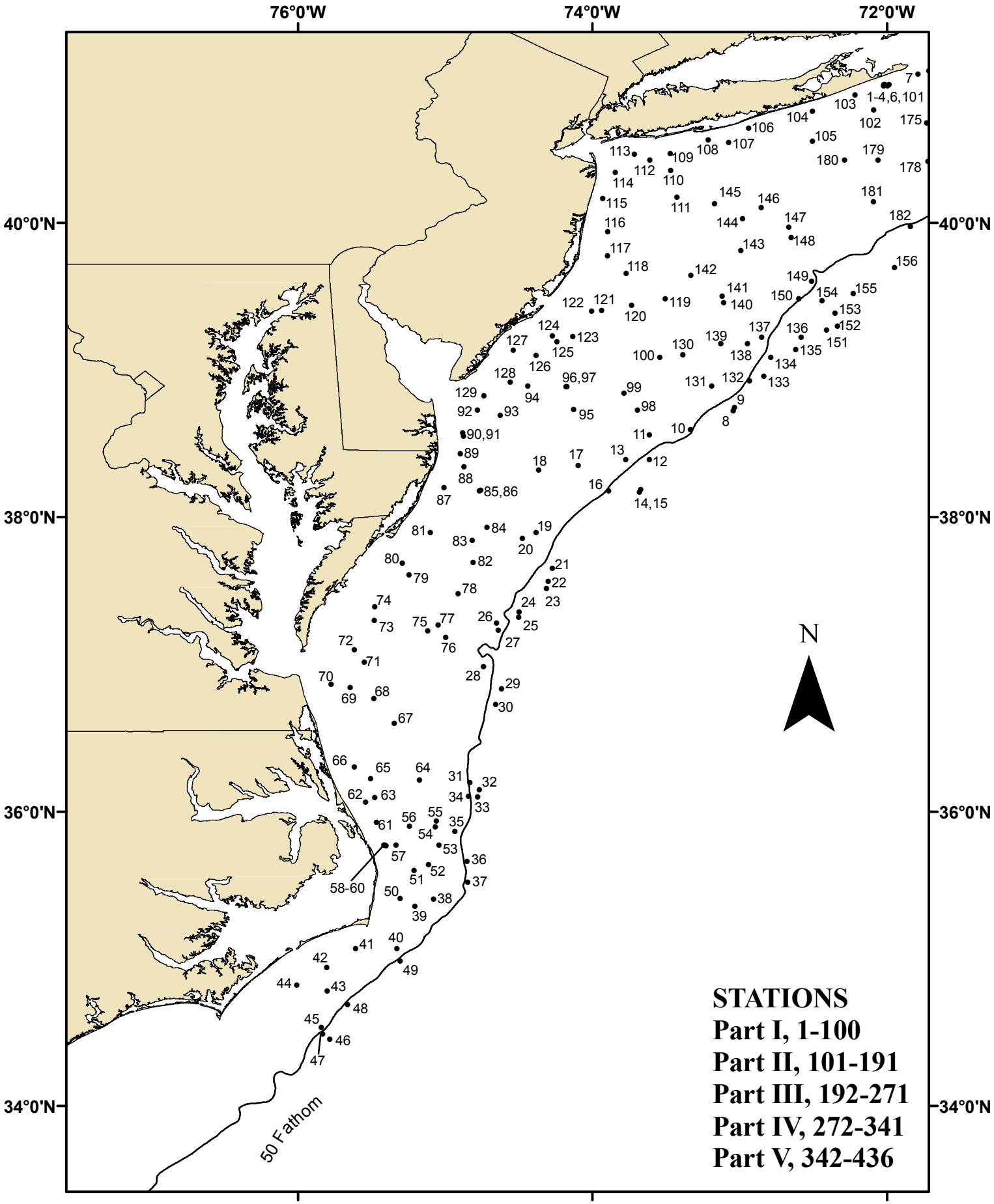

Figure 1. Trawl hauls made from NOAA FRV *Henry B Bigelow* (09-01), during NOAA Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, 27 February - 9 May 2009.

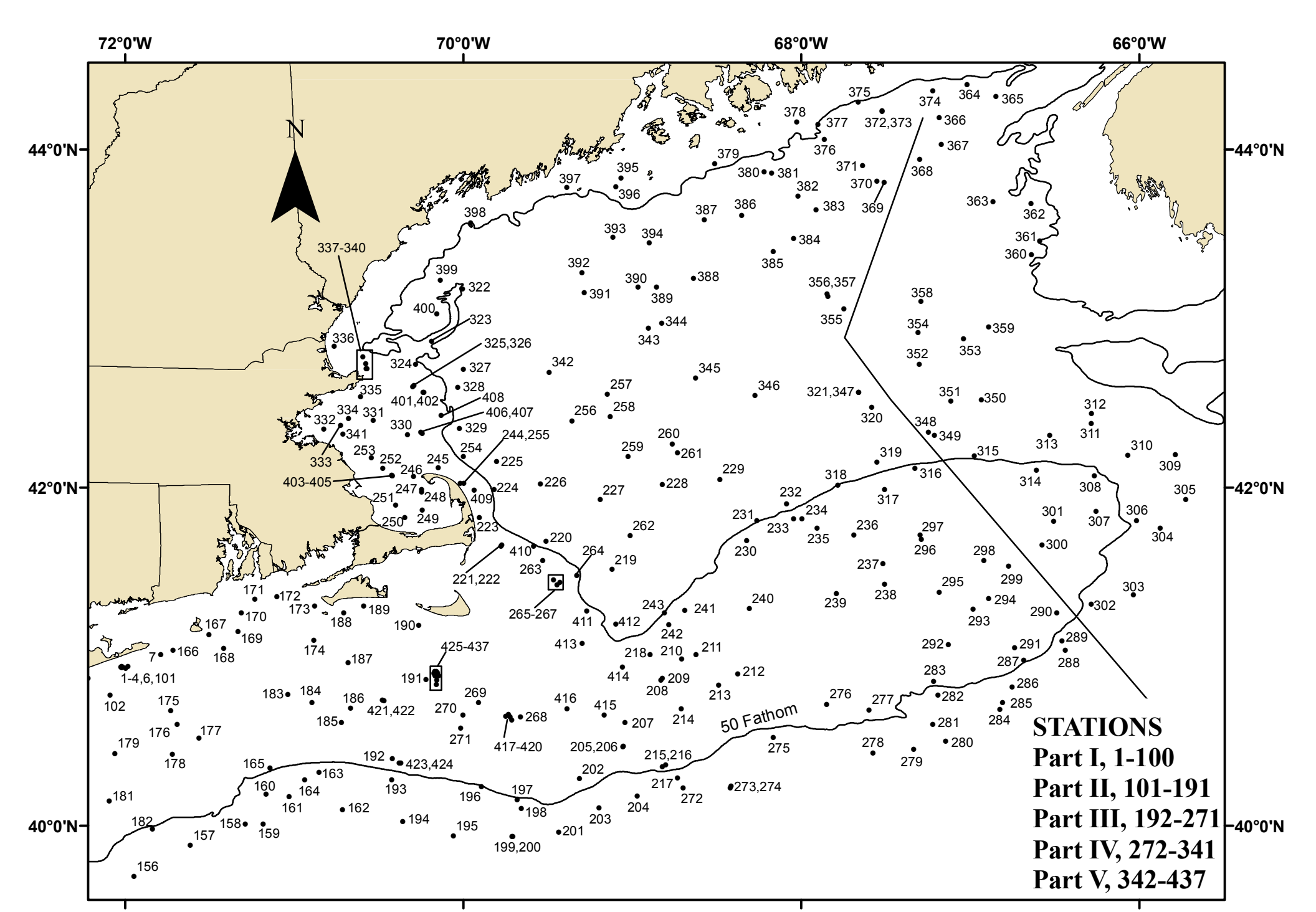

Figure 2. Trawl hauls made from NOAA FSV *Henry B Bigelow* (09-01), during NOAA Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, 27 February - 9 May 2009.